

WHAT IS CLAIMED IS:

1. A transfer fixing apparatus, comprising:
 - an intermediate transfer member having an outer surface onto which a toner image is transferred;
 - a transfer fixing member having an outer surface onto which said toner image is transferred from said intermediate transfer member;
 - a heating member configured to heat said toner image on the outer surface of said transfer fixing member;
 - an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, said toner image being fixed onto a record medium when passing through said nip; and
 - a heat restraining member arranged between said intermediate transfer member and said transfer fixing member, and configured to restrain heat from said transfer fixing member from impacting on said intermediate transfer member.
2. A transfer fixing apparatus, comprising:
 - an intermediate transfer member having an outer surface onto which a toner image is transferred;
 - a transfer fixing member having an outer surface onto which said toner image is transferred by said intermediate transfer member;
 - a heating member configured to heat said toner image on the outer surface of said transfer fixing member; and
 - an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, said toner image being fixed onto a record medium while passing through said nip;wherein said transfer fixing member is separated from said intermediate transfer member by a thickness of said toner image.
3. A transfer fixing apparatus, comprising:
 - an intermediate transfer member having an outer surface onto which a toner image is transferred;
 - a transfer fixing member having an outer surface onto which said toner image is transferred by said intermediate transfer member;

a heating member configured to heat said toner image on the outer surface of said transfer fixing member;

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, said toner image being fixed onto a record medium when passing through said nip; and

a bias supplying member configured to supply a bias onto said intermediate transfer member;

wherein said transfer fixing member is separated from said intermediate transfer member by a thickness of said toner image; and

wherein the bias supplying member makes said toner image on said intermediate transfer member transfer onto said transfer fixing member by electrostatic power of the bias.

4. A transfer fixing apparatus, comprising:

an intermediate transfer member having an outer surface onto which a toner image is transferred;

a transfer fixing member having an outer surface onto which said toner image is transferred by said intermediate transfer member;

a heating member configured to heat said toner image on the outer surface of said transfer fixing member;

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, said toner image being fixed on a record medium when passing through said nip; and

a distance changing member configured to change a distance or contacting pressure between said intermediate transfer member and said transfer fixing member.

5. A transfer fixing apparatus according to claim 4,

wherein said distance changing member is driven except while said toner image is being transferred from said intermediate transfer member to said transfer fixing member.

6. A transfer fixing apparatus according to claim 4,

wherein said distance changing member is driven while said toner image is not being transferred from said intermediate transfer member onto said transfer fixing member when said intermediate transfer member and said transfer fixing member are driven.

7. A fixing apparatus, comprising:
a transfer fixing member having an outer surface onto which a toner image is transferred;
a heating member configured to heat said toner image on the outer surface of said transfer fixing member;
a pressing member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said pressing member, said pressing member configured to press and fix said toner image onto a record medium; and
an elastic layer formed at least in one of said transfer fixing member and said pressing member;
wherein said toner image is formed at a resolution of at least 600dpi, and
wherein a total thickness of said elastic layer in said transfer fixing member and said pressing member is more than a thickness of said record medium.

8. A fixing apparatus, comprising:
a transfer fixing member having an outer surface onto which a toner image is transferred;
a heating member configured to heat said toner image on the outer surface of said transfer fixing member; and
a pressing member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said pressing member, said pressing member configured to press and fix said toner image onto a record medium;
wherein said toner image is formed at a resolution of at least 600dpi; and
wherein said transfer fixing member is driven by a driving source, and is not driven by said transfer fixing member.

9. A fixing apparatus, comprising:
a transfer fixing member having an outer surface onto which a toner image is transferred;
a heating member configured to heat said toner image on the outer surface of said transfer fixing member; and
a pressing member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said pressing member, said pressing member configured to press and fix said toner image onto a record medium;

wherein one of said transfer fixing member and said pressing member includes a belt,
and

wherein said nip is formed such that an upstream pressure is weaker than a downstream pressure in a direction which said record medium passes.

10. A fixing apparatus, comprising:

a transfer fixing member having an outer surface onto which a toner image is transferred;

a heating member configured to heat said toner image on the outer surface of said transfer fixing member;

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member; and

an adhesive power supplying member configured to supply electrostatic adhesive power to a record medium;

wherein said toner image is adhered and fixed on said record medium by said electrostatic adhesive power.

11. A fixing apparatus, comprising:

a transfer fixing member having an outer surface onto which a toner image is transferred;

a heating member configured to heat said toner image on the outer surface of said transfer fixing member; and

a pressing member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said pressing member, said pressing member configured to press and fix said toner image on a record medium;

wherein a direction in which said record medium approaches said nip is substantially parallel to a common tangent to said intermediate transfer member and said transfer fixing member.

12. A fixing apparatus, comprising:

a transfer fixing member having an outer surface onto which said toner image is transferred by an intermediate transfer member;

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, and wherein said toner image is fixed onto a record medium when passing through said nip;

wherein said heating member, comprises:

an inner heating member arranged inside said transfer fixing member, and configured to heat said toner image on said transfer fixing member from a surface side of said transfer fixing member; and

an outer heating member arranged outside said transfer fixing member, and configured to heat said toner image on said transfer fixing member from the surface side of said toner image.

13. A fixing apparatus according to claim 12,
wherein said outer heating member includes a heating reflector.

14. A fixing apparatus according to claim 12,
wherein said outer heating member includes a heating board.

15. A fixing apparatus, comprising:
a transfer fixing member having an outer surface onto which said toner image is transferred;
an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, and wherein said toner image is fixed onto a record medium when passing through said nip; and
a heating member configured to radiate heat onto said toner image on said transfer fixing member from a surface side of said toner image.

16. A fixing apparatus according to claim 15, further comprising;
an intermediate transfer member having an outer surface onto which said toner image is transferred, and configured to transfer said toner image onto said transfer fixing member;
and
a heating preventing member arranged between said heating member and said intermediate transfer member, and configured to prevent heat from said heating member from impacting on said intermediate transfer member.

17. A fixing apparatus according to claim 15,
wherein said heating member includes a radiant source and a double transparent tube surrounding said radiant source.

18. A fixing apparatus according to claim 17,
wherein said double tube includes a vacuum or decompression chamber between an outer tube and an inner tube of said double tube.

19. A fixing apparatus according to claim 15, further comprising:
a contact restraining member configured to transmit radiation by said heating member, and to prevent said toner image on said transfer fixing member from contacting said heating member.

20. A fixing apparatus according to claim 15, further comprising:
a movement restraining member configured to prevent said record medium from contacting said heating member before reaching said nip.

21. A fixing apparatus according to claim 15,
wherein said heating member includes a carbon heater.

22. A fixing apparatus according to claim 21,
wherein said carbon heater comprises:
a carbon member with a board or sheet shape, which makes substantially a right angle to a tangent to a surface of said transfer fixing member, and which radiates heat radiation in a direction of thickness thereof; and
a reflector configured to reflect the radiation by said carbon member to said transfer fixing member.

23. A fixing apparatus, comprising:
a transfer fixing member having an outer surface onto which a toner image is transferred;
an image heating member configured to heat said toner image on the outer surface of said transfer fixing member;

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member said opposite member, and wherein said toner image is fixed onto a record medium when passing through said nip; and

a medium heating member configured to heat said record medium before reaching said nip.

24. A fixing apparatus according to claim 23,
wherein said image heating member heats said toner image on said transfer fixing member from a surface side of said toner image.

25. A fixing apparatus according to claim 23,
wherein said medium heating member includes a radiation source; and
further comprising:
a movement restraining member configured to transmit heat radiation from said record medium heating member, and to prevent said record medium from contacting said medium heating member before reaching said nip.

26. A fixing apparatus according to claim 23, further comprising:
a heating control member configured to change a heating value of said medium heating member.

27. A fixing apparatus according to claim 26,
wherein said heating control member changes said heating value based on a kind or thermal capacity of said record medium.

28. A fixing apparatus according to claim 26,
wherein said heating control member changes said heating value based on an amount, a thickness, or a kind of said toner image.

29. A fixing apparatus according to claim 26,
wherein said heating control member further changes a heating value of said image heating member and further changes a ratio between a heating value of said image heating member and a heating value of said medium heating member.

30. A fixing apparatus according to claim 29,
wherein said heating control member changes said ratio based on a kind or thermal capacity of said record medium.

31. A fixing apparatus according to claim 29,
wherein said heating control member changes said ratio based on an amount, a thickness, or a kind of said record medium.

32. A fixing apparatus according to claim 23,
wherein at least two among said transfer fixing member and said image heating member and said medium heating member are individually exchangeable.

33. A fixing apparatus, comprising:
an intermediate transfer member having an outer surface onto which a toner image is transferred;
a transfer fixing member having an outer surface onto which said toner image is transferred by said intermediate transfer member;
a heating member configured to heat said toner image on the outer surface of said transfer fixing member; and
an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, and wherein said toner image is fixed on a record medium when passing through said nip;
wherein said heating member heats said toner image from a surface side of said toner image, and also heats said record medium before reaching said nip.

34. A fixing apparatus according to claim 33,
wherein said heating member includes a radiation source; and
further comprising:
a movement restraining member configured to transmit heat radiation from said heating member, and to prevent said record medium from contacting said heating member before reaching said nip.

35. A fixing apparatus according to claim 33,

wherein said heating member includes a pair of rollers one of which includes a heating source therein, and which forms the nip.

36. A fixing apparatus according to claim 35,
wherein said heating member heats said toner image on said transfer fixing member while said record medium is moving.

37. A toner image forming apparatus, comprising:
a toner image carrier having an outer surface onto which a toner image is formed;
an intermediate transfer member having an outer surface onto which said toner image is transferred;
a transfer fixing member having an outer surface onto which said toner image is transferred;
a heating member configured to heat said toner image on the outer surface of said transfer fixing member;
an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, and wherein said toner image is fixed onto a record medium when passing through said nip;
a heat restraining member arranged between said intermediate transfer member and said transfer fixing member, and configured to restrain heat from said transfer fixing member from impacting on said intermediate transfer member.

38. A toner image forming apparatus according to claim 37,
wherein said transfer fixing member rotates with a different line speed from said intermediate transfer member, whereby said toner image is transferred from said intermediate transfer member onto said transfer fixing member.

39. A toner image forming apparatus according to claim 37,
wherein WARDELL working sphericiry ϕ of said toner image is more than 0.8.

40. A toner image forming apparatus according to claim 37,
wherein said transfer fixing member rotates with a line speed less than said intermediate transfer member, whereby said toner image is transferred from said intermediate transfer member onto said transfer fixing member.

41. A toner image forming apparatus according to claim 37,
wherein said toner image carries said toner image of single color or plural colors
thereon.

42. A toner image forming apparatus, comprising:
a toner image carrier having an outer surface onto which a toner image is formed;
an intermediate transfer member having an outer surface onto which said toner image
is transferred;
a transfer fixing member having an outer surface onto which said toner image is
transferred;
a heating member configured to heat said toner image on the outer surface of said
transfer fixing member; and
an opposite member formed opposite said transfer fixing member, wherein a nip is
formed between said transfer fixing member and said opposite member, and wherein said
toner image is fixed on a record medium when passing through said nip;
wherein said transfer fixing member is arranged above said intermediate transfer
member.

43. A toner image forming apparatus according to claim 42,
wherein a direction of said record medium sent from said transfer fixing member is
opposite to a direction of said intermediate transfer member just after transferring said toner
image onto said record medium.

44. A toner image forming apparatus according to claim 43,
wherein said transfer fixing member comprises a roller.

45. An toner image forming apparatus according to claim 44,
further comprising a casing comprising:
an upper surface with an output for said record medium; and
a tray connected above said upper surface, to receive said record medium sent
from said output;
wherein said transfer fixing member is arranged at an upper side in said
casing; and

wherein said transfer fixing member, said frame, and said tray are arranged in a path as said record medium is passed from said transfer fixing member to said tray.

46. A toner image forming apparatus according to claim 49,
wherein said transfer fixing member transfers and fixes said toner image onto only one surface of said record medium; and

wherein said transfer fixing member, said upper surface, and said tray are arranged in a path as the surface with said toner image of said record medium faces downward on said tray.

47. A toner image forming apparatus, comprising:
a toner image carrier having an outer surface onto which a toner image is formed;
an intermediate transfer member having an outer surface onto which said toner image is transferred;

a transfer fixing member having an outer surface onto which said toner image is transferred;

a heating member configured to heat said toner image on the outer surface of said transfer fixing member from a surface side of said toner image; and

an opposite member formed opposite said transfer fixing member, wherein a nip is formed between said transfer fixing member and said opposite member, and wherein said toner image is fixed on a record medium when passing through said nip;

wherein said heating member heats said toner image on said transfer fixing member by heat convection between said heating member and said toner image; and

wherein said toner image carrier holds said toner image of plural colors on a surface thereof, and a color with a lowest radiation rate among said plural colors is formed at an outermost position of said transfer fixing member.

48. A record medium recycling method for forming a toner image on a toner image carrier, primarily transferring said toner image onto an intermediate transfer member; secondarily transferring said toner image on said intermediate transfer member onto a transfer fixing member, and thirdly transferring and fixing said toner member on said transfer fixing member onto a record medium, the method comprising:

heating said toner image on said transfer fixing member; and
removing said toner image from said record medium.